

CLAIMS

1. An ID tag comprising a circuit which includes an antenna and an IC chip, and a nullification unit isolating said circuit;

wherein said nullification unit includes a time switch
5 isolating said circuit when a predetermined time limit for operation has reached after the start of use of the ID tag.

2. The ID tag as claimed in Claim 1,

wherein said time switch includes a start unit activating said time switch, and

said time switch is configured so as to isolate said
5 circuit when a predetermined time limit for operation has reached after said time switch was activated by said start unit.

3. The ID tag as claimed in Claim 1,

wherein said time switch is provided in said circuit, and is configured as being switched internally from a conduction state to a non-conduction state so as to isolate
5 said circuit, when said predetermined time limit for operation has reached.

4. The ID tag as claimed in Claim 1,

wherein said time switch is a swtiching element comprising:

a first electrode and a second electrode provided in
5 said circuit in parallel with each other, as being spaced
by a predetermined distance; and

a solid electrolyte film held between these electrode,
having a metal ion supplying section provided in
contact with said solid electrolyte film.

5. The ID tag as claimed in Claim 4,

wherein said solid electrolyte film is composed of a
metal chalcogenide.

6. The ID tag as claimed in Claim 5,

wherein said metal ion supplying section supplies a
metal same as a metal composing said metal chalcogenide.

7. The ID tag as claimed in Claim 4,

wherein a pair of terminals forming a conduction
channel in said solid electrolyte film is connected to said
first and second electrodes.

8. The ID tag as claimed in Claim 1,

wherein said time switch comprises:

a solid electrolyte film provided on a base;

a first conductor provided in contact with said solid
5 electrolyte film;

a second conductor provided as being contact with said
solid electrolyte film, and as being spaced by a

predetermined distance from said first conductor; and

10 a metal ion supplying section provided as being contact
with said solid electrolyte film and as being spaced from
said first and second conductors,

said first and the second conductors being
independently connected to said circuit.

9. The ID tag as claimed in Claim 8,

wherein said solid electrolyte film is configured as
showing p-type conductivity in the initial state thereof,
and

5 as showing an insulating property after use, by being
supplied with a metal from said metal ion supplying section.

10. The ID tag as claimed in Claim 8,

wherein said solid electrolyte film is composed of a
metal chalcogenide.

11. The ID tag as claimed in Claim 10,

wherein said metal ion supplying section supplies a
metal same as a metal composing said metal chalcogenide.

12. The ID tag as claimed in Claim 11,

wherein said metal chalcogenide contains a metal at
an amount lesser than the stoichiometric composition.

13. The ID tag as claimed in Claim 12,

wherein said metal chalcogenide contains a metal at an amount lesser than the stoichiometric composition.

14. The ID tag as claimed in Claim 8,

wherein said time switch comprises:

a first and a second solid electrolyte films provided as being spaced from each other on a base;

5 a first conductor provided in contact with said first solid electrolyte film;

a second conductor provided in contact with both of said first and second solid electrolyte films;

a third conductor provided in contact with said second
10 solid electrolyte film; and

a metal ion supplying section provided in contact with both of said first and second solid electrolyte films, as being spaced from said first, second and third conductors,

said first and second solid electrolyte films being
15 respectively composed of different materials, and

said first and second conductors, and said second and third conductors being respectively provided as being spaced by a predetermined distance from each other, and

said first and third conductors being respectively
20 connected to said circuit.

15. The ID tag as claimed in Claim 1,

wherein said time switch comprises a narrow conductor line provided in said circuit, an air-tight compartment

housing said narrow conductor line, and a start unit breaking
5 the air-tightness of said air-tight compartment to thereby
introduce the air or an oxidative gas into the compartment,
configured as allowing said narrow conductor line to
be oxidezed and so as to isolate said circuit, when a
predetermined time limit for operation has reached after
10 said time switch was activated by said start unit.

16. The ID tag as claimed in Claim 15,
further comprising an oxidant compartment including
an oxidizer, and configured so that said oxidant compartment
and said air-tight compartment are communicated when said
5 start unit is functionalized.

17. The ID tag as claimed in Claim 1,
wherein said time switch comprises:
a first metal interconnection and a second metal
interconnection provided in said circuit in parallel with
5 each other, as being spaced by a predetermined distance;
and

and a gap portion disposed between said first and
second metal interconnections,

configured as allowing said gap portion to turn into
10 a conductive state so as to short-circuit said first and
second metal interconnections to thereby isolate said
circuit, when a predetermined time limit for operation has
reached.

18. The ID tag as claimed in Claim 2,

having a plurality of said time switches differ in the time limit for operation, and configured as allowing said start unit to activate an arbitrary time switch.

19. The ID tag as claimed in Claim 1,

further comprising a pair of shortcircuiting terminals on both ends of said time switch.